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to them—"Martio-centric space in which that planet is fixed. Thus the q -space for Mars is quite different from the p -space on earth" (pp. 175, 176). This however must not be taken to mean that the Martian *manifold* is necessarily different from ours, for space and time denote only the relative *systems*—"are merely ways of expressing certain truths about the relations between events" (p. 168). If then the manifold itself is uniform, what is the basis of the unavoidable differentiation among the systems? It is scarcely sufficient to fall back on the "creative advance of nature" (p. 178), unless we assume that this advance in itself necessitates a non-uniform manifold,²¹ but this of course begs the question. Nor again does uniformity of the manifold necessarily follow from that of the momentary spaces and timeless spaces of p. 194; for these may be no more than mathematical or methodological devices.

But difficulties on points of detail such as those I have mentioned are inevitable; even were they far more serious, still Dr. Whitehead's work constitutes a distinct advance in the discussion of ontology; and if it could be supplemented from the strictly philosophic standpoint, we should be much nearer a lasting and satisfactory realism. There appear to me to be two marked parallel tendencies in current philosophy—one towards absolutism, the other towards realism. But absolutism has for long been misrepresented and therefore misunderstood; it has been presented at once as too subjective and too abstract.²² I do not see anything which prevents realism from taking its place within a system of absolute idealism fuller and deeper than any yet conceived. *Vestigia nulla retrorsum*, some one will say; but then the absolute is not a cave. Even if it were, we are in it already.

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A BEHAVIORISTIC ACCOUNT OF THE SIGNIFICANT SYMBOL

THE statement I wish to present rests upon the following assumptions, which I can do no more than state: I assume, provisionally, the hypothesis of the physical sciences, that physical objects and the physical universe may be analyzed into a complex of physical corpuseles. I assume that the objects of immediate ex-

²¹ As distinct, *i.e.*, from the systems. There must be some distinction, otherwise we should have systems of measurement with nothing to measure; "a measure-system measures something inherent in nature" (p. 196).

²² "The Absolutism which comes in for rebuke at the hands of pluralist critics is a fiction of their own imagination." Radhakrishnan, *Reign of Religion in Philosophy*, p. 407.

perience exist in relationship to the biologic and social individuals whose environments they make up. This relationship involves on the one hand the selection through the sensitivities and reactions of the living forms of those elements that go to make up the object. On the other hand these objects affect the plants and animals whose natures are responsible for them as objects, *e.g.*, food exists as an immediate experience in its relation to the individuals that eat it. There is no such thing as food apart from such individuals. The selection of the characters which go to make up food is a function of living individuals. The effect of this food upon the living individuals is what we call adaptation of the form to the environment or its opposite. Whatever may be said of a mechanical universe of ultimate physical particles, the lines that are drawn about objects in experience are drawn by the attitudes and conduct of individual living forms. Apart from such an experience involving both the form and its environment, such objects do not exist.

On the other hand these objects exist objectively, as they are in immediate experience. The relation of objects making up an environment to the plants and the animals in no sense renders these objects subjective. What are termed the natures of objects are in the objects, as are their so-called sensuous qualities, but these natures are not in the objects either as external or internal relations, they are of the very essence of the objects, and become relations only in the thought process. The so-called sensuous qualities exist also in the objects, but only in their relations to the sensitive organisms whose environments they form.

The causal effect of the living organisms on their environment in creating objects is as genuine as the effect of the environment upon the living organism. A digestive tract creates food as truly as the advance of a glacial cap wipes out some animals or selects others which can grow warm coats of hair. An animal's sensitiveness to a particular character in an object gives the object in its relation to the animal a peculiar nature. Where there is sensitiveness to two or more different characters of the object, answering to reactions that conflict and thus inhibit each other, the object is in so far analyzed. Thus the width of a stream would be isolated from the other characters of the stream through the inhibition of the animal's tendency to jump over it. In the immediate experience in which the animal organism and its environment are involved, these characters of the objects and the inhibited reactions that answer to them are there or exist, as characters, though as yet they have no significance nor are they located in minds or consciousnesses.

Among objects in the immediate experience of animals are the

different parts of their own organisms, which have different characters from those of other objects—especially hedonic characters, and those of stresses and excitements—but characters not referred to selves until selves arise in experience. They are only accidentally private, *i.e.*, necessarily confined to the experience of single individuals. If—after the fashion of the Siamese Twins—two organisms were so joined that the same organ were connected with the central nervous system of each, each would have the same painful or pleasurable object in experience. A toothache or a pleased palate are objects for a single individual for reasons that are not essentially different from those which make the flame of a match scratched in a room in which there is only one individual an object only for that individual. It is not the exclusion of an object from the experience in which others are involved which renders it subjective; it is rendered subjective by being referred by an individual to his self, when selves have arisen in the development of conduct. Exclusive experiences are peculiarly favorable for such reference, but characteristics of objects for every one may be so referred in mental processes.

Among objects that exist only for separate individuals are so-called images. They are *there*, but are not necessarily *located* in space. They do enter into the structure of things, as notably on the printed page, or in the hardness of a distant object; and in hallucinations they may be spatially located. They are dependent for their existence upon conditions in the organism—especially those of the central nervous system—as are other objects in experience such as mountains and chairs. When referred to the self they become memory images, or those of a creative imagination, but they are not mental or spiritual stuff.

Conduct is the sum of the reactions of living beings to their environments, especially to the objects which their relation to the environment has “cut out of it,” to use a Bergsonian phrase. Among these objects are certain which are of peculiar importance to which I wish to refer, *viz.*, other living forms which belong to the same group. The attitudes and early indications of actions of these forms are peculiarly important stimuli, and to extend a Wundtian term may be called “gestures.” These other living forms in the group to which the organism belongs may be called social objects and exist as such before selves come into existence. These gestures call out definite, and in all highly organized forms, partially predetermined reactions, such as those of sex, of parenthood, of hostility, and possibly others, such as the so-called herd instincts. In so far as these specialized reactions are present in the nature of individuals, they tend to arise whenever the appropriate stimu-

lus, or gesture calls them out. If an individual uses such a gesture, and he is affected by it as another individual is affected by it, he responds or tends to respond to his own social stimulus, as another individual would respond. A notable instance of this is in the song, or vocal gesture of birds. The vocal gesture is of peculiar importance because it reacts upon the individual who makes it in the same fashion that it reacts upon another, but this is also true in a less degree of those of one's own gestures that he can see or feel.

The self arises in conduct, when the individual becomes a social object in experience to himself. This takes place when the individual assumes the attitude or uses the gesture which another individual would use and responds to it himself, or tends so to respond. It is a development that arises gradually in the life of the infant and presumably arose gradually in the life of the race. It arises in the life of the infant through what is unfortunately called imitation, and finds its expression in the normal play life of young children. In the process the child gradually becomes a social being in his own experience, and he acts toward himself in a manner analogous to that in which he acts toward others. Especially he talks to himself as he talks to others and in keeping up this conversation in the inner forum constitutes the field which is called that of mind. Then those objects and experiences which belong to his own body, those images which belong to his own past, become part of this self.

In the behavior of forms lower than man, we find one individual indicating objects to other forms, though without what we term signification. The hen that pecks at the angleworm is directly though without intention indicating it to the chicks. The animal in a herd that scents danger, in moving away indicates to the other members of the herd the direction of safety and puts them in the attitude of scenting the same danger. The hunting dog points to the hidden bird. The lost lamb that bleats, and the child that cries each points himself out to his mother. All of these gestures, to the intelligent observer, are significant symbols, but they are none of them significant to the forms that make them.

In what does this significance consist in terms of a behavioristic psychology? A summary answer would be that the gesture not only actually brings the stimulus-object into the range of the reactions of other forms, but that the nature of the object is also indicated; especially do we imply in the term significance that the individual who points out indicates the nature to *himself*. But it is not enough that he should indicate this meaning—whatever meaning is—as it exists for himself alone, but that he should indicate that meaning as it exists for the other to whom he is pointing

it out. The widest use of the term implies that he indicates the meaning to any other individual to whom it might be pointed out in the same situation. In so far then as the individual takes the attitude of another toward himself, and in some sense arouses in himself the tendency to the action, which his conduct calls out in the other individual, he will have indicated to himself the meaning of the gesture. This implies a definition of meaning—that it is an indicated reaction which the object may call out. When we find that we have adjusted ourselves to a comprehensive set of reactions toward an object we feel that the meaning of the object is ours. But that the meaning may be ours, it is necessary that we should be able to regard ourselves as taking this attitude of adjustment to response. We must indicate to ourselves not only the object but also the readiness to respond in certain ways to the object, and this indication must be made in the attitude or rôle of the other individual to whom it is pointed out or to whom it may be pointed out. If this is not the case it has not that common property which is involved in signification. It is through the ability to be the other at the same time that he is himself that the symbol becomes significant. The common statement of this is that we have in mind, what we indicate to another that he shall do. In giving directions, we give the direction to ourselves at the same time that we give it to another. We assume also his attitude of response to our requests, as an individual to whom the direction has the same signification in his conduct that it has to ourselves.

But signification is not confined to the particular situation within which an indication is given. It acquires universal meaning. Even if the two are the only ones involved, the form in which it is given is universal—it would have the same meaning to any other who might find himself in the same position. How does this generalization arise? From the behavioristic standpoint it must take place through the individual generalizing himself in his attitude of the other. We are familiar enough with the undertaking, in social and moral instruction to children and to those who are not children. A child acquires the sense of property through taking what may be called the attitude of the generalized other. Those attitudes which all assume in given conditions and over against the same objects, become for him attitudes which every one assumes. In taking the rôle which is common to all, he finds himself speaking to himself and to others with the authority of the group. These attitudes become axiomatic. The generalization is simply the result of the identity of responses. Indeed it is only as he has in some sense amalgamated the attitudes of the different rôles in which he has addressed himself that he acquires the unity

of personality. The "me" that he addresses is constantly varied. It answers to the changing play of impulse, but the group solidarity, especially in its uniform restrictions, gives him the unity of universality. This I take to be the sole source of the universal. It quickly passes the bounds of the specific group. It is the *vox populi*, *vox dei*, the "voice of men and of angels." Education and varied experience refine out of it what is provincial, and leave "what is true for all men at all times." From the first, its form is universal, for differences of the different attitudes of others wear their peculiarities away. In the play period, however, before the child has reached that of competitive games—in which he seeks to pit his own acquired self against others—in the play period this process is not fully carried out and the child is as varied as his varying moods; but in the game he sees himself in terms of the group or the gang and speaks with a passion for rules and standards. Its social advantage and even necessity makes this approach to himself imperative. He must see himself as the whole group sees him. This again has passed under the head of passive imitation. But it is not in uniform attitudes that universality appears as a recognized factor in either inner or outer behavior. It is found rightly in thought and thought is the conversation of this generalized other with the self.

The significant symbol is then the gesture, the sign, the word which is addressed to the self when it is addressed to another individual, and is addressed to another, in form to all other individuals, when it is addressed to the self.

Signification has, as we have seen, two references, one to the thing indicated, and the other to the response, to the instance and to the meaning or idea. It denotes and connotes. When the symbol is used for the one, it is a name. When it is used for the other, it is a concept. But it neither denotes nor connotes except, when in form at least, denotation and connotation are addressed both to a self and to others, when it is in a universe of discourse that is oriented with reference to a self. If the gesture simply indicates the object to another, it has no meaning to the individual who makes it, nor does the response which the other individual carries out become a meaning to him, unless he assumes the attitude of having his attention directed by an individual to whom it has a meaning. Then he takes his own response to be the meaning of the indication. Through this sympathetic placing of themselves in each other's rôles, and finding thus in their own experiences the responses of the others, what would otherwise be an unintelligent gesture, acquires just the value which is connoted by signification, both in its specific application and in its universality.

It should be added that in so far as thought—that inner conversation in which objects as stimuli are both separated from and related to their responses—is identified with consciousness, that is in so far as consciousness is identified with awareness, it is the result of this development of the self in experience. The other prevalent signification of consciousness is found simply in the presence of objects in experience. With the eyes shut we can say we are no longer conscious of visual objects. If the condition of the nervous system or certain tracts in it, cancels the relation of individual and his environment, he may be said to lose consciousness or some portion of it; *i.e.*, some objects or all of them pass out of experience for this individual. Of peculiar interest is the disappearance of a painful object, *e.g.*, an aching tooth under a local anesthetic. A general anesthetic shuts out all objects.

As above indicated analysis takes place through the conflict of responses which isolates separate features of the object and both separates them from and relates them to their responses, *i.e.*, their meanings. The response becomes a meaning, when it is indicated by a generalized attitude both to the self and to others. Mind, which is a process within which this analysis and its indications take place, lies in a field of conduct between a specific individual and the environment, in which the individual is able, through the generalized attitude he assumes, to make use of symbolic gestures, *i.e.*, terms, which are significant to all including himself.

While the conflict of reactions takes place within the individual, the analysis takes place in the object. Mind is then a field that is not confined to the individual much less is located in a brain. Significance belongs to things in their relations to individuals. It does not lie in mental processes which are enclosed within individuals.

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BOOK REVIEWS

The Analysis of Mind. BERTRAND RUSSELL. London: George Allen and Unwin. New York: The Macmillan Co. 1921. Pp. 310.

The book deals with that conception of the nature of mind which is involved in regarding physical objects as constructs of appearances. Thus it is in effect the logical sequel to views expressed by the author in his Lowell Lectures, and in it he has given us what is the most complete and balanced statement to date of the results of his philosophic method.

Mr. Russell's central thesis is that all psychical phenomena are built up out of sensations and images, and nothing else. This involves